

South Star Cogeneration LLC is seeking approval from the CEC to construct and operate the South Star Cogeneration Project (South Star) in western Kern County approximately 35 miles southwest of Bakersfield, California. The South Star Project will consist of two substantially identical cogeneration plants, South Star I (Section 17, T32S, R23E) and South Star II (Section 7, T32S, R23E), that are located approximately 1.5 miles apart on contiguous Texaco California Inc. (TCI) property in the South Midway-Sunset Oilfield. The Application for Certification (AFC) presents an evaluation of the entire South Star Project in a manner to clearly indicate the environmental affects associated with each site and its related linear facilities.

South Star I includes the following project components shown on Figure 2-1:

- South Star I site;
- Replacement of poles and conductor for approximately 4.7 miles of existing 12.47 kV transmission line;
- 0.6 mile 115 kV extension to South Star I site;
- Alternative stand-alone 5.3 mile 115 kV transmission line;
- 3.6 miles of natural gas line (Kern-Mojave to Station 109 and natural gas line placed within TCI Utility Corridor Segment A);
- Approximately 2.4 miles Alternative Route 1 natural gas line; and
- Improved access road (Midoil Road to South Star I site).

South Star II includes the following project components as shown on Figure 2-1:

- South Star II site;
- 3.8 mile addition of second 115 kV circuit on proposed South Star I transmission line;
- 1.4 miles of natural gas line (placed within TCI Utility Corridor Segment B);
- Approximately 1.5 mile Alternative aboveground Route 2 natural gas line; and
- Improved access road (Midoil Road to South Star II site).

8.2.1 Applicable Laws, Ordinances, Regulations, and Standards

The laws, ordinances, regulations, and standards (LORS) related to biological resources that potentially apply to the South Star Cogeneration Project (South Star) are discussed below.

Federal Endangered Species Act: Compliance with the Endangered Species Act (ESA) of 1973 (as amended) applies to the project because it is located within habitat areas determined to be currently or historically occupied by threatened or endangered San Joaquin kit fox (*Vulpes macrotis mutica*), blunt-nosed leopard lizard (*Gambelia sila*), giant kangaroo rat (*Dipodomys ingens*) and Hoover's woolly star (*Eriastrum hooveri*). Since the project's proposed transmission line crosses lands administered by federal departments, the Department of the Interior Bureau of Land Management (BLM), and there is a likelihood of "take", it will be addressed under a Section 7 consultation between BLM and the U.S. Fish and Wildlife Service (USFWS). The BLM has agreed to initiate this consultation for the entire project, including private lands.

National Environmental Policy Act (NEPA): As discussed above, there is federal involvement in the project because the proposed transmission line route crosses BLM land in Section 35, T31S, R22E. Additionally, a portion of the South Star I natural gas pipeline crosses BLM land in Section 9, T32S, R23E. Compliance with NEPA will be necessary for these portions of the project. This will necessitate preparation of an Environmental Assessment to review project and cumulative impacts on environmental resources. The BLM has agreed to take responsibility for NEPA compliance on all federal lands impacted by the project.

Section 404 of the Clean Water Act (CWA): The U.S. Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act, regulates discharges of dredged or fill material in "waters of the United States." The term "waters" includes wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations (CFR). The definition of "waters of the United States" includes "...intrastate lakes, rivers, streams (including intermittent streams)...the use, degradation or destruction of

which could affect interstate or foreign commerce...” and tributaries of water defined as waters of the United States.

Some intermittent washes may qualify as waters of the United States. Areas that meet the definition of waters of the United States or the definition of wetlands would be under USACE jurisdiction. Any impacts in these areas could require a permit, depending on the type and size of the activity within USACE jurisdiction.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act, Title 16 United States Code, Sections 703 and 712 prohibits the take of migratory birds.

California Endangered Species Act (CESA): Compliance with the CESA is required because the project area is within habitats currently or historically occupied by the threatened San Joaquin kit fox and San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), and the endangered giant kangaroo rat and blunt-nosed leopard lizard. If project field assessments indicate that there is a likelihood of “take” of these species, consultation with the California Department of Fish and Game (CDFG) under Fish and Game Code Section 2050 and 2091 will be required.

California Environmental Quality Act (CEQA): The effects of the project on environmental resources must be analyzed and assessed as to their significance using criteria provided in various sections and appendices of CEQA. The CEC’s site certification process will fulfill CEQA requirements.

Section 1603 Streambed Alteration Agreement: Any activity that will divert or obstruct the natural flow or change the bed, bank, or channel of any river, stream, or lake must provide a Streambed Alteration Notification to CDFG. Additionally, Streambed Alteration Notification is required if streambed material is proposed for removal. Streambed Alteration Notification may result in a Streambed Alteration Agreement between the project applicant and CDFG. A Streambed Alteration Agreement is likely required, and South Star will prepare and submit the appropriate application in July, 2001.

Fish and Game Code Section 3503: protects California’s birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

Fish and Game Code Section 3503.5: protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Fish and Game Code Section 3513: protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

Fish and Game Code Sections 3511, 4700, 5050, and 5515: prohibit take of animals that are classified as Fully Protected in California.

Fish and Game Code Section 1900 et seq.: designates state rare, threatened, and endangered plants.

California Code of Regulations Title 14, Sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

8.2.2 Affected Environment

8.2.2.1 Regional Setting

The South Star I and II Project areas are located in the southern San Joaquin Valley, a broad treeless plain in the rain shadow of the Coast Ranges. The region's climate can be characterized as Mediterranean, with hot, dry summers and cool, moist winters. Summer high temperatures typically exceed 100° Fahrenheit (F), with an average of 110 days per year over 90°F. Winter temperatures in the San Joaquin Valley are mild, with an average of 16 days per year with frost (Twisselmann, 1967).

Rainfall increases from west to east, with the west side of the valley receiving an average of around 4 inches per year and the east side averaging about 6 inches per year. Winter fog, called "tule fog", sometimes forms during the months of November, December, and January, supplementing the annual precipitation. On average, approximately 90 percent of the rainfall occurs between November 1 and April 1. The region periodically experiences drought cycles, the most recent of which occurred during the mid and late 1980s (Twisselmann, 1967).

These conditions have contributed to the formation of vegetation adapted to dry conditions, and made the area distinguishable from the Mojave Desert to the east due to tule fog, higher humidity, and isolation from continental climatic influences by mountain ranges (Twisselmann, 1967).

8.2.2.2 Vegetation

For the purposes of this assessment, the vegetation of the South Star Project I and II areas are adequately described in Holland 1986. Where an equivalent series has been identified by Sawyer and Keeler-Wolf (1995), the series is shown in parentheses.

Valley Saltbush Scrub (Allscale Series). In the South Star Project I and II areas, the shrub cover in this vegetation community is typically dominated by common saltbush (*Atriplex polycarpa*). Other shrub species that may be present include spiny saltbush (*A. spinifera*), cheesebush (*Hymenoclea salsola*), and pale-leaf goldenbush (*Isocoma acradenia* var. *bracteata*). The understory typically consists of winter-germinating annuals dominated by nonnative grasses, such as bromes (*Bromus* spp.), wild oats (*Avena barbata* and *A. fatua*), foxtail (*Hordeum* spp.), and fescues (*Vulpia* spp.). Native spring-flowering annuals may include bird's eye gilia (*Gilia tricolor*), fiddleneck (*Amsinckia menziesii* var. *intermedia*), white layia (*Layia glandulosa*), and several species of phacelia (*Phacelia* spp.). On the South Star I and II sites, this community also contains shrubs that are more typically elements of Interior Coast Range saltbush scrub, such as matchweed (*Gutierrezia californica*) and bladderpod (*Isomeris arborea*).

Nonnative Grassland (California Annual Grassland Series). This community is distributed throughout the South Star Project I and II areas, mainly as an understory component to valley saltbush scrub. Nonnative grasses dominate (bromes, foxtail, fescues, and oats), with showy annual forbs present to a varying degree depending on rainfall. Forbs that are typically present include red-stemmed filaree (*Erodium cicutarium*), owl's clover (*Castilleja exserta* and *C. attenuata*), lupines (*Lupinus* spp.), goldfields (*Lasthenia californica*), fiddleneck, gilia, and several mustards. Cover may be sparse to dense, with annuals typically germinating in late fall and most species flowering in early to late spring.

This community is widely distributed through California, generally below 3,000 feet in elevation.

8.2.2.3 Wildlife

General Wildlife. The valley saltbush scrub and nonnative grassland habitats in the South Star Project area support a wide variety of birds, mammals, and reptiles. Bird species include, but are not limited to red-tailed hawks (*Buteo jamaicensis*), northern harrier, (*Circus cyaneus*), burrowing owl (*Athene cunicularia*), western meadowlark (*Sturnella neglecta*), and loggerhead shrike (*Lanius ludovicianus*). Mammals occupying these habitat types are black-tailed hare (*Lepus californicus*), desert cottontail (*sylvilagus audubonii*), kangaroo rats (*Dipodomys* spp.), deer mouse (*Peromyscus maniculatus*), kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), bobcat (*Felis rufus*), and American badger (*Taxidae taxus*). Amphibians and reptiles include western toad (*Bufo boreus*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), western rattlesnake (*Crotalus viridis*), and gopher snake (*Pituophis melanoleucus*).

Economically Important Species. There are two gamebird species, mourning dove (*Zenaida macroura*) and California quail (*Callipepla californica*) that occur in the proposed South Star Project area. These species have some recreational value to hunters but have no important economic value. There are no species of economic importance in the South Star Project area.

Biologically Sensitive Areas. The majority of the South Star I and II Project areas lies outside any biologically sensitive area; however, the proposed electrical transmission line and natural gas pipeline traverses portions of the Buena Vista Valley Management Area, administered by the BLM.

8.2.2.4 Special Status Species

Lists of special status wildlife and plant species known to occur or potentially occurring in the vicinity of the South Star I and II are shown in Tables 8.2-1 and 8.2-2, respectively. These species were identified by reviewing a search of the California Natural Diversity Database, reviewing unpublished biological reports produced for other projects in

the area, and staff experience and knowledge of sensitive flora and fauna of the southern San Joaquin Valley. Descriptions of these species can be found in Appendix C.

8.2.3 Biological Survey

8.2.3.1 Survey Methodology

Surveys for the South Star I and II Project area were conducted by wildlife biologists and botanists between April 8 and June 6, 2001. Surveys were conducted primarily for listed plant and animal species, following USFWS- and CDFG-approved survey methodologies for sensitive species (CDFG, 1990) while concurrently surveying for other special status plant and wildlife species with the potential to occur in the area. This section provides a discussion of the survey methodology used during the field review of the South Star I and II Project areas and associated facilities. The field survey forms are included in Appendix C, Biological Assessment Support Documents.

The transmission line and natural gas pipeline corridors were surveyed using a method suggested by the California Energy Commission (CEC) (Figure 8.2-1). Briefly, a 100-foot corridor centered on the transmission line corridor was surveyed with two transects 50 feet wide. A primary buffer zone, 500 feet on either side of the corridor, was surveyed by walking 12 transects approximately 80 feet apart. Two meandering transects were walked in a secondary buffer zone, consisting of an additional 500 feet on either side of the primary buffer zone. Transects in the secondary buffer zone were also 50 feet in width. Approximately one mile of the Alternate 1 Natural Gas Pipeline was not surveyed. However, in the unlikely event that this alternative is selected, South Star would conduct the biological survey of that portion of the pipeline prior to construction.

The South Star I and II sites were surveyed by walking eight transects within the 23-acre parcel, six transects 50 feet wide within a 500-foot primary buffer area, and meandering transects in a one-mile secondary buffer area (see Figure 8.2-1).

During the survey, all dens, burrows, and other evidence of special status species were noted. A vascular plant list was compiled consisting of all identifiable plant species observed. San Joaquin kit fox potential and known dens, giant kangaroo rat burrows, San

Joaquin antelope squirrel burrows, burrowing owl burrows, and locations of target special status plant species were mapped on a site map. Suitable blunt-nosed leopard lizard habitat was noted and mapped on a site map. Most of the survey fell within the acceptable survey dates and temperature ranges for blunt-nosed lizard to be active.

The San Joaquin kit fox dens were classified according to the following USFWS kit fox den definitions (USFWS, 1989):

Known Den: Any existing natural den or man-made structure for which conclusive evidence or strong circumstantial evidence can show that the den is used or has been used at any time in the past by San Joaquin kit fox.

Potential Den: Any natural den or burrow within the range of the species that has entrances of appropriate dimensions (4 to 12 inches in diameter) to accommodate San Joaquin kit foxes for which, however, there is little to no evidence of kit fox use.

Pupping Den: Any known San Joaquin kit fox den (as defined) used by kit foxes to whelp and/or rear their pups.

Atypical Den: Any known San Joaquin kit fox den that has been established in, or in association with, a man-made structure.

8.2.3.2 Results

The following sensitive plants and animals were found at or near the South Star I and II sites and associated utility corridors:

- | | |
|---|--|
| <ul style="list-style-type: none"> • Sensitive animals <ul style="list-style-type: none"> — San Joaquin kit foxes — San Joaquin antelope ground squirrels — American badger — Blunt-nosed leopard lizard — Burrowing owls — Loggerhead shrikes | <ul style="list-style-type: none"> • Sensitive plants <ul style="list-style-type: none"> — Gypsum-loving larkspur — Tejon poppy — Cottony buckwheat — Hollisteria |
|---|--|

- Leconte's thrashers
- Giant kangaroo rats

Tables 8.2-3 through 8.2-8 list the occurrences of each of the sensitive species and their proximity to the South Star I and South Star II sites and in 1 mile segments of the transmission line and natural gas pipeline corridors. Appendix C contains 1:6,000 scale maps with locations of sensitive biological resources depicted on them. Figure 8.2.2 shows the locations of the one-mile 1:6000 maps.

Tables 8.2-7 and 8.2-8 provide a complete list of wildlife and plants observed during the spring 2001 biological surveys of the proposed South Star I and II Project sites and associated utility corridors.

8.2.4 Environmental Consequences

8.2.4.1 Direct Take of Individuals

The construction and operation of South Star I and II could result in killing or injuring sensitive wildlife and plant species. The types of hazards that could occur are as follows:

- Road kills due to vehicle collision and entombment pipes;
- Power line collisions by birds;
- Electrocution of birds; and
- Entrapment of individuals in burrows and open trenches.

Transmission line design and mitigation measures, contained in the following section and in the permits obtained from regulatory agencies, will minimize the chance of injury or mortality and reduce potential impacts to less than significant levels.

8.2.4.2 Habitat Loss/Disturbance

Construction of the South Star I and II Project sites and associated facilities would result in temporary and permanent losses of habitat important to common and sensitive wildlife and plant species in the area. A detailed discussion of the impacts this habitat loss and disturbance would have on specific species (i.e., the San Joaquin kit fox, giant kangaroo

rat, blunt-nosed leopard lizard, San Joaquin antelope squirrel, and the California Condor) is provided below. Table 8.2-9 contains estimates of the habitat losses expected from construction of South Star I, South Star II, and the related facilities.

Natural Gas Pipeline. Construction of either natural gas line alternative will involve some re-grading of existing roads and construction of new access and spur roads. It is estimated that total road work would involve a total of approximately 0.5 miles or approximately 0.6 acres of temporary disturbance. The pipeline itself would temporarily disturb a 75-foot corridor over its length. The longest alternative is 2.4 miles or 21.8 acres. Therefore, the worst case temporary disturbance associated with either natural gas pipeline routes would be a total of 22.4 acres.

There will be no temporary disturbance associated with placing the natural gas pipeline on the above ground piperack within either Segment A or Segment B of the TCI South Midway Utility Corridor.

Transmission Line. Construction of either transmission alternative will involve some re-grading of approximately 2 miles of existing access roads and construction of approximately 1 mile of new access and spur roads. Replacement of existing poles or construction of new poles would encompass approximately 3,750 square feet of construction area per pole location. Additionally, it is estimated that construction of the transmission line will involve 2 stringing stations encompassing approximately 100,000 square feet each; 5 stringing stations encompassing approximately 40,000 square feet each.

Roadway work, pole placement, and stringing stations to support transmission line construction, which total approximately 25.8 acres of temporary disturbance, will occur within the corridors surveyed for cultural, paleontological, and biological resources.

Indirect Impacts. As discussed in Section 2.6 of the project description, South Star I can support up to 227 new wells within Sections 17 and 21 and South Star II can support up to 227 new wells within Sections 7 and 8. TCI has estimated that approximately 90% of these new wells will be “in-fill” wells. The remaining 10% will be “step-out” wells.

An “in-fill” well is defined as a well that will be located within a boundary defined by the BLM in its programmatic opinion for the area. A well that will be located outside this boundary is a “step-out” well. TCI has estimated that the temporary disturbance associated with construction access and pipeline interconnections for an “in-fill” well is 0.23 acres per well and 0.45 acre per well for a “step-out well. Therefore, the temporary disturbance associated with 227 new wells would be 57.3 acres for South Star I and 57.3 acres for South Star II.

The mitigation measures discussed in South Star Project Biological Resources Mitigation Implementation Management Plan (BRMIMP) will reduce impacts due to habitat loss to less than significant levels.

Most of the acreage that will be either temporarily or permanently disturbed is privately owned, a small portion of the natural gas pipeline and a portion of the electrical transmission corridors are owned by BLM. South Star will provide habitat compensation land, which was calculated using the compensation ratios below:

- Permanent impacts: 3.0:1
- Temporary impacts: 1.1:1

Table 8.2-10 summarizes the amount of compensation acreage associated with South Star I, South Star II, and related facilities.

8.2.4.3 Species Specific Impacts

San Joaquin Kit Fox. All of the South Star I and II Project areas and associated transmission line corridor contain suitable habitat for San Joaquin kit foxes. Kit foxes or their sign were observed at numerous locations near the facility sites and along the transmission line corridor. Construction of the South Star I and II Project sites, will disturb foraging and denning kit fox habitat. Amounts of disturbance corresponding to the possible construction scenarios can be found in Table 8.2.10. There also exists some chance of take of individual kit foxes due to injury and mortality during construction and operation. Measures proposed in the South Star Project BRMIMP will mitigate and minimize impacts to San Joaquin kit foxes associated with the proposed project.

Giant kangaroo rat / Blunt-nosed leopard lizard. Both project sites and most of the utility corridors, contains habitat unsuitable for giant kangaroo rats and blunt-nosed leopard lizards due to the heavy disturbance or steep terrain. Approximately 9 acres of habitat of these species will be temporarily disturbed if the preferred natural gas pipeline (Alternate Route 1) is implemented. However, along the preferred alignment of the natural gas pipeline, there also exists a minimal chance of take of individual giant kangaroo rats and blunt-nosed leopard lizards due to injury and mortality during construction and operation. Measures proposed in the South Star Project BRMIMP will mitigate and minimize impacts to giant kangaroo rats and blunt-nosed leopard lizards associated with the proposed project.

San Joaquin antelope squirrel. Both project sites and all associated utility line corridors contain suitable habitat for San Joaquin antelope squirrels. Antelope squirrels were observed at numerous locations near the facility sites and along the utility line corridors. Construction of South Star I and II will disturb foraging and burrowing habitat. There also exists some chance of take of individual antelope squirrels due to injury and mortality during construction and operation. Measures proposed in the South Star Project BRMIMP will mitigate and minimize impacts to San Joaquin antelope squirrels associated with the proposed project.

California Condor. Prior to their removal from the wild in 1994, California condors were known to occur in the vicinity of the project near Taft, CA and over the Temblor Range just west of the project site. Capture-bred condors have been reintroduced to the wild in an attempt to recover the species. California condors were not observed in the project area during the 2001 spring surveys. However, the potential exists for condors to fly over the project area in route to Sierra Nevada foothill foraging areas. Construction of the South Star I and II Project sites will disturb potential condor foraging habitat. Some potential for take of individuals exists by electrocution and transmission line collision. The chance of electrocution is very unlikely because of transmission line pole design; wires will be too far apart to allow electrocution. Condors may collide with the power lines associated with this project, however, the probability of collision should be reduced because of the transmission line aversion training the captive-bred birds receive prior to being released. The project is located within or near existing oil fields where many similar structures exist, so the project

does not create substantially new hazards in the area. Measures proposed in the South Star Project BRMIMP will mitigate and minimize impacts to California condors associated with the proposed project.

Listed Plants. California jewelflower, San Joaquin woolly threads, Hoover's woolly star, or Kern mallow were not observed either at the project sites or along the utility line corridors. The South Star I and II Projects are expected to have no impacts on listed plant populations.

Other Species of Concern. Burrowing owls, gypsum-loving larkspur, Tejon poppy, cottony buckwheat, loggerhead shrikes, hollisteria, Leconte's thrashers, American badgers, and nesting raptors are other species of concern found during the surveys. All of these species are often found in habitats associated with the listed species discussed above. Mitigation measures designed to minimize impacts to the listed species will also minimize impacts to these species. Specific measures to protect burrowing owls, LeConte's thrashers, and nesting raptors are contained in the South Star Project BRMIMP.

8.2.4.4 Noise

South Star I and II sites and utility line corridors are in areas that have been developed for oil production. The noise from the proposed construction is not expected to exceed the levels that normally occur during oil production activities. Common and sensitive wildlife species in the area will not be exposed to any unusual levels of noise and will not be significantly affected by this potential impact.

8.2.4.5 Light

South Star I and II sites are in an area that contains artificial lighting because of oilfield facilities. Lights from the cogeneration facility are not expected to have any significant impact on the behavior of wildlife in the area.

8.2.4.6 Air Quality

Dust and air emissions are strictly regulated in the San Joaquin Valley Air Pollution Control District and will not exceed levels considered harmful to wildlife and plants during the construction and operation of the South Star I and II Projects.

8.2.5 Proposed Conditions of Certification

In order to ensure compliance with applicable LORS and/or to reduce potentially significant impacts to less than significant levels, proposed conditions of certification are contained in Appendix K.

The proposed conditions of certification include a condition (**BIO-5**) to address the potential for indirect impacts associated with the 227 new potential wells that may be served by South Star I and II each. This condition was duplicated from the Sunrise Project (98-AFC-4). The Sunrise Project, although now licensed as a simple cycle plant, was originally a cogeneration project with TCI as its thermal host. TCI would have used Sunrise steam in its thermally enhanced oil recovery (EOR) operations in the same manner as proposed by South Star I and II.

The condition proposed by South Star was adopted by the Sunrise Siting committee in its presiding member's proposed decision in May 2000. Since South Star and Sunrise would both serve TCI's new wells, the proposed condition is directly applicable for the same rationale adopted by the Sunrise Siting committee.

8.2.6 Cumulative and Indirect Impacts

The South Star I and II Project sites will provide steam for existing and planned wells in South Midway-Sunset Oilfield leases operated by Texaco California Inc.(TCI). If the South Star I and II facilities are not built, wells will either be supplied by conventional steam generators, an alternate third party provider similar to the South Star Project, or TCI will operate at reduced crude oil production levels. The impacts to sensitive biological resources associated with any new wells will be addressed by TCI.

Cumulative impacts are those impacts of future State and private actions that are reasonably certain to occur. Future Federal actions will be subject to the consultation requirement established in Section 7 of the Federal Endangered Species Act and, therefore, are not considered cumulative to the proposed action.

There are other projects currently under review by state, county, and local authorities where biological surveys have documented the present or former occurrence of

the San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, giant kangaroo rat, and California condor. These projects include urban development, construction and expansion of highways and canals, conversion of natural land for agricultural purposes, mineral and wind energy development, flood control and reservoir construction, rodenticide use, and grazing on private and public lands. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species. The resource agencies reviewing these actions are aware of these threats and are adopting appropriate measures to minimize the threat.

Most of the impacts of this project are within habitats previously or currently disturbed by on-going oilfield activities. This project does not significantly increase the baseline level of disturbance in the existing oilfields, along the transmission line corridor, or at the substation sites. Many of the oilfield related cumulative impacts are being addressed in other Endangered Species Act compliance actions, such as the Valley Floor Habitat Conservation Plan (VFHCP).

The Draft Valley Floor Habitat Conservation Plan (VFHCP) classifies San Joaquin Valley lands within Kern County, not covered by existing habitat conservation plans, into Red, Green, and White Zones. Red Zone lands are considered highest valued conservation habitat; Green zone lands provide valuable linkage, corridor routes and conservation habitat; White zone lands contain habitat that does not fit into overall conservation goals. The strategy of the VFHCP is to establish a safety net criteria to preserve 90% of Red Zone lands (approximately 79,576 acres). This strategy would allow for the development of 8,842 acres of these lands over the 30 year life of the plan. The La Paloma Project, Elk Hills Project, Midway Sunset Power Project, Sunrise Power Project, and South Star I and II Project sites collectively will permanently impact less than 120 acres of habitat and less than 10 acres of Red Zone habitat. Impacts to Red Zone lands is limited to transmission line and pipeline corridors (La Paloma- approximately 7 miles, Elk Hills- approximately 1 mile) and would constitute less than 0.1 % of the impacted acreage allowed under the VFHCP. Other foreseeable oil, agricultural, and urban developments that would be considered cumulative to or indirect impacts from the South Star Project would be adequately mitigated under the VFHCP.

8.2.7 Other Required Permits/Approvals.

The following provides a list of other permits or approvals required:

Permit/Approval	Responsible Agency	Schedule
Section 7 ESA Compliance	Bureau of Land Management	October 31, 2001
NEPA Compliance	Bureau of Land Management	October 31, 2001

8.2.8 Agency Contacts

Agency	Contact/Title	Telephone
Bureau of Land Management	Larry Saslaw 3801 Pegasus Drive Bakersfield, CA 93308	(661) 391-6086
U.S. Fish and Wildlife Service	Peter Cross 3310 El Camino Avenue, Suite 130 Sacramento, CA 95821-6340	(916) 441-6655
California Department of Fish Game	Donna Daniels 1234 East Shew Avenue Fresno, CA 93710	(559) 243-4104

8.2.9 LORS Conformance

Table 8.2-11 provides a list of AFC subsections where discussion of conformance with each LORS item can be found.

8.2.10 References

- CDFG, 1990. California Department of Fish and Game Region 4 Survey Methodologies for San Joaquin Kit Fox, Blunt-Nosed Leopard Lizard, San Joaquin Antelope Squirrel, Tipton Kangaroo Rat, and Giant Kangaroo Rat. Compiled by R. Rempel and G. Presley.
- Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*.
- Twisselman, E. C. 1967. "A Flora of Kern County, California" *Wasmann J. Biol.* 24:1-395.
- USFWS, 1989. *Endangered and Threatened Wildlife and Plants*. U.S. Government Printing Office: U.S. Fish and Wildlife Service, 1989-0-225-765:QL3.

Table 8.2-1. Special Status Wildlife Species with Potential to Occur Within the South Star Project Area

Species	Status* Federal/State	Habitat
Invertebrates		
<i>Branchinecta longiantenna</i> Longhorn fairy shrimp	FE	Requires intermittent pools of water
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FE	Requires intermittent pools of water
<i>Lepidurus packardii</i> Vernal pool tadpole shrimp	FT	Requires intermittent pools of water
Reptiles		
<i>Scaphiopus hammondi</i> western spadefoot toad	FSC/CSC	Requires pools of water for breeding
<i>Gambelia sila</i> blunt-nosed leopard lizard	E/E	Open saltbush scrub and grassland habitats, roads, and open washes
Birds		
<i>Athene cunicularia</i> burrowing owl	- / CSC	Valley grasslands and open saltbush scrub
<i>Gymnogyps californianus</i> California Condor	E/E	Forages in valley grasslands and saltbush scrub
<i>Lanius ludovicianus</i> loggerhead shrike	- / CSC	Valley grasslands and saltbush scrub
<i>Toxostoma lecontei</i> LeConte's thrasher	- / CSC	Prefers mature saltbush scrub for nesting
Mammals		
<i>Ammospermophilus nelsoni</i> San Joaquin antelope squirrel	- / T	Shrublands, especially along washes
<i>Dipodomys ingens</i> giant kangaroo rat	E/E	Open habitats, grassland, and open saltbush scrub
<i>Dipodomys nitratoides brevinasus</i> short-nosed kangaroo rat	FSC/CSC	Western and southern side of the San Joaquin Valley, saltbush scrub, and other alluvial plain and low foothill habitats
<i>Onychomys torridus tularensis</i> Tulare grasshopper mouse	- / CSC	Scrub and grassland habitats on the west side of the San Joaquin Valley
<i>Perognathus inornatus</i> San Joaquin pocket mouse	- / CSC	Open habitats in the San Joaquin Valley
<i>Taxidea taxus</i> American badger	- / CSC	Grassland and scrub habitats of the San Joaquin Valley and surrounding foothills
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	E/T	Grassland and scrub habitats of the San Joaquin Valley and surrounding foothills
E = Endangered T = Threatened FSC = Federal Species of Concern CSC = California Species of Concern		

Table 8.2-2. Special Status Plant Species with Potential to Occur Within the South Star Project Area

Species	Status* Federal/State/CNPS	Habitat
<i>Amsinckia vernicosa</i> var. <i>furcata</i> forked fiddleneck	FSC/CSC/1B	Foothill grassland and scrub habitats
<i>Caulanthus californicus</i> California jewelflower	E/E/1B	Saltbush scrub
<i>Cirsium crassicaule</i> slough thistle	FSC/-/1B	Wet areas
<i>Delphinium gypsophilum</i> ssp. <i>gypsophilum</i> gypsum-loving larkspur	- / - / 4	saltbush scrub and grasslands of low foothills, especially north-facing slopes
<i>Delphinium recurvatum</i> Recurved larkspur	FSC/CSC/1B	Alkali sink, frequently with spiny saltbush
<i>Eriastrum hooveri</i> Hoover's wooly star	T ¹ / - /4	Open, sparsely vegetated areas in saltbush scrub and grassland
<i>Eriogonum gossypinum</i> cottony buckwheat	FSC/CSC/1B	Open slopes, especially south-facing
<i>Eschscholtzia lemmonii</i> spp. <i>kernensis</i> Tejon poppy	- / - / 1B	Low foothills of southern and western San Joaquin Valley
<i>Hollisteria lanata</i> hollisteria	FSC/CSC/1B	Grassland and saltbush scrub
<i>Lembertia congdonii</i> San Joaquin wooly threads	E/ - /1B	Grassland, primarily sandy soils
<i>Opuntia basilaris</i> var. <i>treleasei</i> Bakersfield cactus	E/E/1B	Mesas and washes with sandy soils
<i>Stylocline citroleum</i> oil neststraw	FSC/ - /1B	Open, sparsely vegetated areas in valley grassland and saltbush scrub

CNPS = California Native Plant Society

E = Endangered

T = Threatened

FSC = Federal Species of Concern

CSC = California Species of Concern

1B = Rare or endangered in California and elsewhere

4 = Plants of limited distribution

Table 8.2-3. Sensitive Biological Resource Locations, Number of Occurrences, and Their Proximity to the South Star Project Sites

Facility	Resource	Site	Within 500 feet	Within 1,000 feet
South Star I (Sec. 17)	Known kit fox den	none	none	1
	Potential kit fox den	none	none	1
	American badger	none	1 dig	1
	Gypsum loving larkspur	none	1	1
	Tejon poppy	none	1	1
South Star II (Sec. 7)	Potential kit fox den	none	1	1
	San Joaquin antelope squirrels	none	1	none
	Gypsum loving larkspur	none	3	3
	Tejon poppy	none	none	1
	Cottony buckwheat	none	2	none

Table 8.2-4. Sensitive Biological Resource Locations per Mile Segment, Number of Occurrences and Their Proximity to the Proposed Centerline of the Proposed Natural Gas Line and Combined Line (Kern-Mojave Tie-in to South Star I and II).

Resource	Mile Map Segments Where Found	Number of Locations on Centerline	Number of Locations Within Primary Buffer Zone	Number of Locations Within Secondary Buffer Zone
Kit fox known dens	1	none	1	none
Kit fox sign	1,2	1	none	1
Kit fox potential dens	1,2,3,4,5	1	13	7
Leopard lizard habitat	1	none	1	1
Abandoned giant kangaroo rat colonies	1,2	2	2	1
Antelope squirrels	1,2,3,4	1	7	4
Burrowing owls	1	none	none	1
Loggerhead shrike	1,5	1	1	none
Leconte's thrasher	3	none	none	1
American badger	4	none	2	3
Cottony buckwheat	3,5	2	4	none
Tejon poppy	5	none	1	none
Gypsum loving larkspur	4	none	2	none

Table 8.2-5. Sensitive Biological Resource Locations per Mile Segment, Number of Occurrences and Their Proximity to the Proposed Centerline of the Electrical Transmission Line Route

Resource	Mile Map Segments Where Found	Number of Locations on Centerline	Number of Locations Within Primary Buffer Zone	Number of Locations Within Secondary Buffer Zone
Hollisteria	5	none	1	none
Gypsum loving larkspur	4,5,6,7,8,9	8	25	11
Tejon poppy	4,5,9	1	7	1
Cottony buckwheat	5,6	2	2	none
Kit fox pupping dens	6	none	1	
Kit fox known dens	6	2	1	none
Kit fox potential dens	4,5,6,7,8	10	62	2
Antelope squirrels	4,6	none	1	1
Burrowing owl	6	none	3	
Loggerhead shrike	5,9	2	2	none
American badger	4,5,6	none	2	3
Stick nests	5	2	none	none

Table 8.2-6. Sensitive Biological Resource Locations per Mile Segment, Number of Occurrences and Their Proximity to the Proposed Centerline of the Alternate Route 2 Natural Gas Pipeline

Resource	Mile Map Segments Where Found	Number of Locations on Centerline	Number of Locations Within Primary Buffer Zone	Number of Locations Within Secondary Buffer Zone
Gypsum loving larkspur	6	none	2	4
Tejon poppy	6	none	1	1
Cottony buckwheat	10	none	1	none
Kit fox sign	10	none	1	none
Leopard lizard potential	10	none	2	none
Antelope squirrels	6	none	3	none
Kit fox potential dens	6,10	none	9	none
Loggerhead shrike	10	none	1	none

Table 8.2-7. Vascular Plants Observed During Biological Surveys Conducted for the South Star Project

Common Name	Scientific Name
Annual bursage	<i>Ambrosia acanthicarpa</i>
Rancher's fireweed	<i>Amsinckia menziesii</i> var. <i>intermedia</i>
Dwarf loco	<i>Atragalus didymocarpus</i>
Freckled mildvetch	<i>Astragalus lentiginosus</i> var. <i>nigracalycis</i>
Common saltbush	<i>Atriplex polycarpa</i>
Slender wild oat	<i>Avena barbata</i>
Ripgut brome	<i>Bromus diandrus</i>
Downy brome	<i>Bromus hordeaceus</i>
Red brome	<i>Bromus madritensis</i> ssp. <i>rubens</i>
Sun cups	<i>Camissonia campestris</i>
Shepherd's purse	<i>Capsella bursa-pastoris</i>
Valley tassels	<i>Castilleja attenuata</i>
Purple owl's clover	<i>Castilleja exserta</i>
Yellow star thistle	<i>Centaurea melitensis</i>
Sandmat	<i>Chamaesyce polycarpa</i>
Pineapple weed	<i>Chamomilla suaveolens</i>
Pygmy stonecrop	<i>Crassula connata</i>
Coyote melon	<i>Cucurbita palmata</i>
Tansy mustard	<i>Descurainia sophia</i>
Blue dicks	<i>Dichelostemma congestum</i>
Parry's mallow	<i>Eremalche parryi</i> ssp. <i>parryi</i>
Turkey mullein	<i>Eremocarpus setigerus</i>
Gypsum loving larkspur	<i>Delphinium gypsophyllum</i>
	<i>Eriastrum pluriflorum</i>
Pale-leaf goldenbush	<i>Isocoma acradenia</i> var. <i>bracteosa</i>
Cottony buckwheat	<i>Eriogonum gossypinum</i>
Long-beaked filaree	<i>Erodium botrys</i>
Red-stemmed filaree	<i>Erodium cicutarium</i>
	<i>Filago californica</i>
Herbia impia	<i>Filago gallica</i>
	<i>Gilia minor</i>
Matchweed	<i>Gutierrezia californica</i>
	<i>Herniaria hirsuta</i> ssp. <i>cinerea</i>
Summer mustard	<i>Hirschfeldia incana</i>
Hollisteria	<i>Hollisteria lanata</i>
Farmer's foxtail	<i>Hordeum murinum</i> ssp. <i>leporinum</i>

Table 8.2-7. (Continued)

Common Name	Scientific Name
Cheesebush	<i>Hymenoclea salsola</i>
Bladderpod	<i>Isomeris arborea</i>
Prickly lettuce	<i>Lactuca serriola</i>
Goldfields	<i>Lasthenia californica</i>
Tidytips	<i>Layia pentachaeta</i> ssp. <i>albida</i>
Common peppergrass	<i>Lepidium nitidum</i>
Calf lotus	<i>Lotus wrangelianus</i>
	<i>Lupinus nanus</i>
Snake's heads	<i>Malacothrix coulteri</i>
Cheeseweed	<i>Malva parviflora</i>
Horehound	<i>Marrubium vulgare</i>
Hollisteria	<i>Hollisteria lanata</i>
Yellow sweetclover	<i>Melilotus officinalis</i>
San Joaquin blazing star	<i>Mentzelia pectinata</i>
Winged pectocarya	<i>Pectocarya penicillata</i>
Tansy phacelia	<i>Phacelia tanacetifolia</i>
Valley popcorn flower	<i>Plagiobothrys canescens</i>
Arizonepopcorn flower	<i>Plagiobothrys arizonicus</i>
Pine bluegrass	<i>P. scabrella</i>
Tejon poppy	<i>Eschscholtzia lemmonii</i> spp. <i>kernensis</i>
	<i>Salsola tragus</i>
Thistle sage	<i>Salvia carduacea</i>
Arabian grass	<i>Schismus arabicus</i>
London rocket	<i>Sisymbrium irio</i>
Oriental mustard	<i>Sisymbrium orientale</i>
Pin-point clover	<i>Trifolium gracilentum</i>
Tom-cat clover	<i>T. willdenovii</i>
Few-flowered fescue	<i>Vulpia microstachys</i> var. <i>pauciflora</i>
Foxtail fescue	<i>Vulpia myurosi</i> var. <i>hirsuta</i>

**Table 8.2-8. Wildlife Observed During Biological Surveys
Conducted for the South Star Project**

Common Name	Scientific Name
Birds	
Killdeer	<i>Charadrius vociferus</i>
golden eagle	<i>Aquila chrysaetos</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
California quail	<i>Callipepla californica</i>
mourning dove	<i>Zenaida macroura</i>
greater roadrunner	<i>Geococcyx californianus</i>
burrowing owl	<i>Athene cunicularia</i>
white-throated swift	<i>Aeronautes saxatalis</i>
Western kingbird	<i>Tyrannus verticalis</i>
ash-throated flycatcher	<i>Myiarchus tyrannulus</i>
Say's phoebe	<i>Sayornis saya</i>
horned lark	<i>Eremophila alpestris</i>
common raven	<i>Corvus corax</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
European starling	<i>Sturnus vulgaris</i>
savannah sparrow	<i>Melospiza melodia</i>
lark sparrow	<i>Chondestes grammacus</i>
sage sparrow	<i>Amphispiza belli</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
golden-crowned sparrow	<i>Zonotrichia atricapilla</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
house finch	<i>Carpodacus mexicanus</i>
Mammals	
Coyote	<i>Canis latrans</i>
Bobcat	<i>Felis rufus</i>
Badger	<i>Taxidea taxus</i>
San Joaquin kit fox	<i>Vulpes Macrotis mutica</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
San Joaquin antelope squirrel	<i>Ammospermophilus nelsoni</i>
Reptiles	
side-blotched lizard	<i>Uta stansburiana</i>
western whiptail	<i>Cnemidophorus tigris</i>
western rattlesnake	<i>Crotalus viridis</i>
gopher snake	<i>Pituophis melanoleucus</i>

Table 8.2-9. Estimated Disturbance to Wildlife and Plant Habitats Resulting from Construction of Each of the South Star Project's Proposed Facilities

Facility	Permanent	Temporary
South Star I		
Power plant/Switchyard	5.8	—
Roads and Parking	0.5	—
Steam/feed/wastewater lines		
Freshwater pipelines		
Natural gas pipeline		22.4
Laydown/Cut and fill areas		16.7
Transmission Line	0.3	25.8
Impact Acreage Totals	6.6	64.9

Indirect Impacts Acreage	
Facility	Private Lands (acres) Permanent Impact
227 new oil production wells and steam injections wells, steam lines, and dirt roads	57.3 ¹
Impact Acreage Totals	57.3

Facility	Permanent	Temporary
South Star II		
Power plant/Switchyard	5.8	—
Roads and Parking	0.5	—
Steam/feed/wastewater lines		
Freshwater pipelines		
Natural gas pipeline		
Laydown/Cut and fill areas		16.7
Transmission Line		
Impact Acreage Totals	6.3	16.7

Indirect Impacts Acreage	
Facility	Private Lands (acres) Permanent Impact
227 new oil production wells and steam injections wells, steam lines, and dirt roads	57.3 ¹
Impact Acreage Totals	57.3

¹ For infill development:

227 wells x 90% = 204 infill wells x 0.23 acres per well = 46.9 acres

For step-out development:

227 wells x 10% - 23 step-out wells x 0.45 acres per well = 10.4 acres

Total indirect impacts acreage impacts – 46.9 acres + 10.4 acres = 57.3 acres.

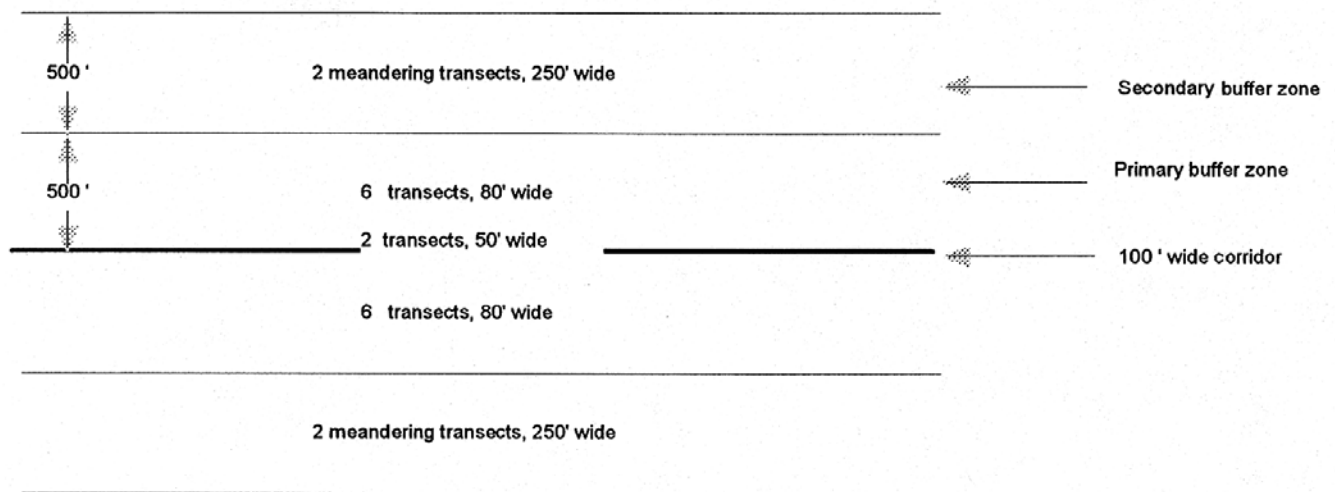
Table 8.2-10. Compensation Acreage

South Star I Facility Component	Impact Acreage (acres)	Compensation Ratio	Compensation Acreage (acres)
Permanent Impacts	6.6	3:1	19.8
Temporary Impacts	64.9	1.1:1	71.4
Indirect Impacts	57.3	1.1:1	63.0
Total South Star I			154.2

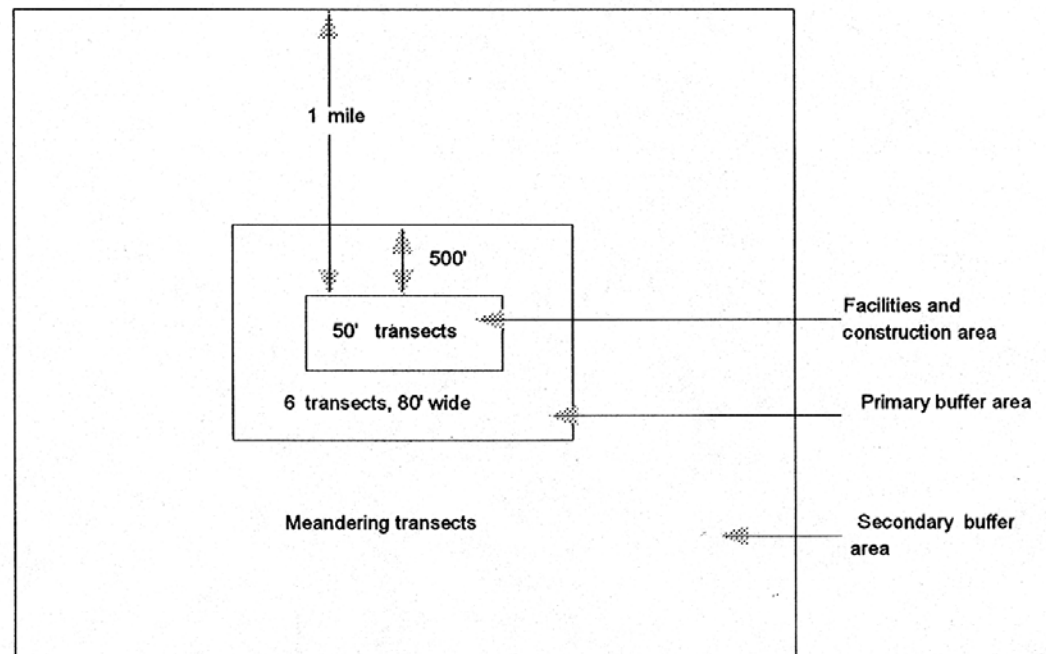
South Star II Facility Component	Impact Acreage (acres)	Compensation Ratio	Compensation Acreage (acres)
Permanent Impacts	6.3	3:1	18.9
Temporary Impacts	16.7	1.1:1	18.4
Indirect Impacts	57.3	1.1:1	63.0
Total South Star II			100.3

Table 8.2-11. South Star Project Summary of LORS and Compliance

Jurisdiction	Authority	Administering Agency	AFC Conformance Section
Federal	Endangered Species Act of 1973; 16 USC § 1531 et. seq.; 50 CFR Parts 17 and 222	U.S. Fish and Wildlife Service (USFWS)	8.2.5
Federal	National Environmental Policy Act; 42 USC § 4321 et. seq.	Bureau of Land Management (BLM), Department of Energy (DOE), and USFWS	8.2.4
Federal	Clean Water Act of 1977; 33 USC § 1251 – 1376, 30 CFR § 330.5(a)(26)	U.S. Army Corps of Engineers (USACE)	8.2.4.2
Federal	Rivers and Harbors Act, Section 10; 33 USC § 401 et. seq.	USACE	8.2.4.2
State	California Endangered Species Act of 1984; California Fish & Game Code §§ 2050 – 2091	California Department of Fish and Game (CDFG)	8.2.4.1
State	California Fish & Game Code & 1603	CDFG	8.14.2
State	California Environmental Quality Act: California Public Resources Code § 21000 et. seq.	CEC	8.2.4



Corridor Survey Effort



Facility Site Survey Effort

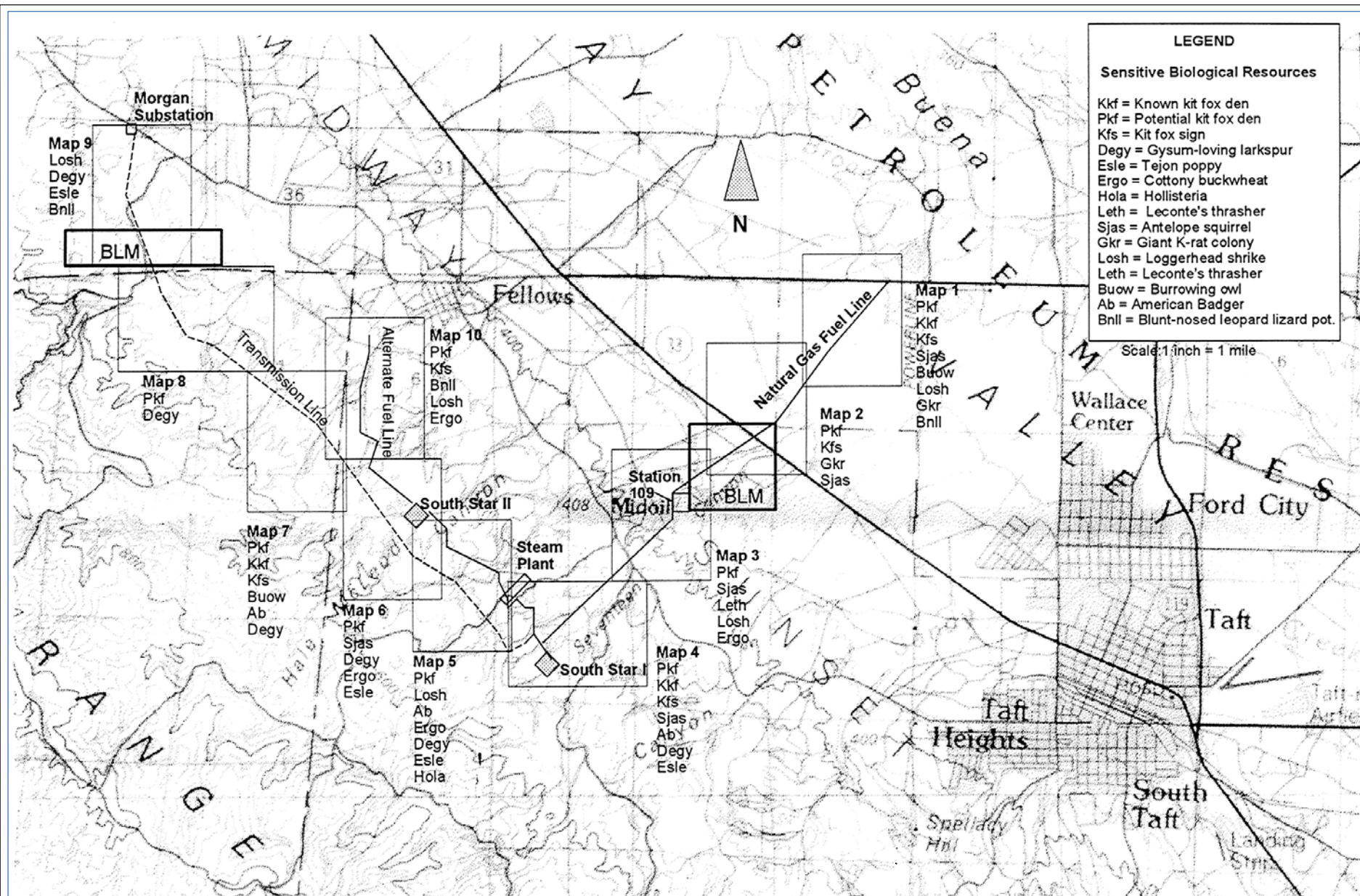


Project No. 51-00167034.00

South Star
Cogeneration Project

CEC APPROVED
BIOLOGICAL SURVEY EFFORT

Figure
8.2-1



URS

Project No. 51-00167034.00

South Star
Cogeneration Project

**SOUTH STAR PROJECT FACILITY LOCATIONS
1:6,000 MAP LOCATIONS AND
GENERAL LOCATIONS OF
SENSITIVE BIOLOGICAL RESOURCES**

Figure
8.2-2